

The length of the attachment screws 49 and the spring-like end regions of the retaining clamp 51 are adapted to each other so that, after the attachment screws 49 have been screwed into the frame 41, the retaining clamp 51 exerts a force on the top side of the second heat sink part 9 with a defined force, which is sufficient to fix the second heat sink part 9 in a sufficiently stable attachment and a sufficiently good heat transfer onto the first heat sink part.

Obviously, this mounting device can also be used with each of the previously described embodiments of a cooling device.

In this way, an essential goal and an essential advantage of the present invention is realized in a simple way, namely creating a cooling device - including a suitable mounting device - in which the cooling device 1 or the second heat sink part can be separated from the first heat sink part in a simple way without requiring direct manipulations of the critical - since it is sensitive - interface between the electronic component part 3 and the cooling device 1. In this way, especially for cooling devices with a liquid coolant, the advantage is achieved that, for example, for maintenance or repair work on the circuit board, for which the circuit board must be removed from the device, the coolant circuit does not have to be separated and also the interface between the component part 3 and the cooling device does not have to be touched or separated.

Claims

1. Cooling device for an electronic component, especially for a microprocessor,

a) with a heat sink (7, 9), which can be connected to the electronic component (3) to be cooled, such that the waste heat generated by the electronic component (3) is transferred and transported away to the heat sink (7, 9) via a thermal interface of the electronic component, characterized in that

b) the heat sink (7, 9) comprises a first heat sink part (7), which is formed for connection to the electronic component (3), and

c) the heat sink (7, 9) comprises a second heat sink part (9), which is connected detachably to the first heat sink part (7), such that a low heat transfer resistance is given, wherein at least the predominant part of the waste heat is transferred to a coolant via the second heat sink part (9).

2. Cooling device according to Claim 1, characterized in that the second heat sink part (9) has at least one channel (15), which carries a flow of a liquid coolant, for example, water, and in that on the second heat sink part (9), a supply connection (23) and a return connection (25) are provided, which are connected to the one or more channels (15).

3. Cooling device according to Claim 1 or 2, characterized in that the first heat sink part (7) comprises a contact surface for thermal connection to the second heat sink part (9), which has a structure (11) for increasing the contact surface, wherein the contact surface of the first heat sink part (7) interacts with a complementary contact surface of the second heat sink part (9).

4. Cooling device according to Claim 3, characterized in that the structures are formed as at least one rib (11, 13) with beveled, preferably flat edges, and preferably have a trapezoidal cross section.

5. Cooling device according to Claim 4, characterized in that at least one channel (15) for the coolant is provided at least in the rib or ribs (13) of the contact surface of the second heat sink part (9).

6. Cooling device according to one of Claims 2 to 5, characterized in that the second heat sink part (9) has a collection chamber, from which several channels (15) for the coolant branch out of or open into this chamber, in the region of the supply connection (23) and/or the return connection (25).

7. Cooling device according to one of Claims 2 to 6, characterized in that the second heat sink part (9) has greater dimensions than the first heat sink part (7) at least in one direction relative to the contact surface with the first heat sink part (7) and in that the second heat sink part (9) is formed so that an essentially uniform heat transfer is possible with reference to the contact surface by means of the coolant flow through the one or more channels (15) in the contact surface with the first heat sink part.

8. Cooling device according to one of the preceding claims, characterized in that the first heat sink part (7) is formed as a heat pipe.

9. Cooling device according to one of the preceding claims, characterized in that an attachment device is provided, which comprises means for preferably detachable connection of the first heat sink part (7) to the electronic component (3) to be cooled.

10. Cooling device according to Claim 9, characterized in that the attachment device comprises additional means for detachable connection of the second heat sink part (9) to the first heat sink part (7), wherein when the second heat sink part (9) is detached from the first heat sink part (7), the first heat sink part (7) remains connected to the electronic component (3).

11. Rack for storing several electronic components, such as servers for data-processing systems,

a) wherein at least one electronic component (3) to be cooled is arranged on several electronic components (27),

characterized in that

b) the electronic components (3) to be cooled are each equipped with a cooling device (1) according to one of the preceding Claims 2 to 5, which is formed as a cooling device carrying a flow of liquid medium.

12. Rack according to Claim 11, characterized in that the second heat sink parts (9) of the cooling devices (1) are connected with their supply (23) and return connections (25) to one or more central coolant reservoirs or one or more central heat exchangers, by means of which heat is drawn away from the coolant.

13. Rack according to Claim 12, characterized in that the one or more central coolant reservoirs or the one or more central heat exchangers are arranged in or on the rack (29).

14. Rack according to Claim 11, characterized in that in the rack (29) there is a line system, which connects the supply connection (23) of the cooling devices (1) to one or more central supply connections (31) of the rack (29) and the return connections (25) of the cooling devices (1) to one or more central return connections (33) of the rack (29).

15. Rack according to Claim 13 or 14, characterized in that in the rack (29) there is at least one preferably rigid supply riser (35), which is arranged fixed in the rack (29) and which has several connections (39) for preferably flexible connection lines each from a connection (39) to a supply connection (23) of a second heat sink part (9) of a cooling device (1), and in that in the rack (29) there is at least one preferably rigid return riser (37), which is arranged fixed in the rack (29) and which has several connections (39) for preferably flexible connection lines each from a connection (39) to a return connection (25) of a second heat sink part (9) of a cooling device (1).

16. Rack according to Claim 14 or 15, characterized in that the line system comprises a supply riser and a return riser, and also an outlet line connected to the return riser, wherein the flow lengths of all of the connected cooling devices are at least approximately equal, wherein the

flow lengths are given from the partial lengths of the supply riser and the return riser used by the affected partial flow of the corresponding cooling device.